CLAIMS

1. A method for reserving spare bandwidth for a link in a communication network including a plurality of links comprising the steps of:

monitoring the volume of traffic routed through each link of the communication network;

simulating a single link failure for each link of the communication network;

determining the volume of traffic which would be rerouted through each link for maintaining existing communication after each of the simulated single link failures;

determining the volume of traffic removed from each link after each of the simulated single link failures;

calculating for each link the difference between the volume of traffic which would need to be rerouted through each link and the corresponding volume of traffic removed from each link for each of the simulated single link failures;

determining for each link the maximum value of the calculated differences for all simulated single link failures; and

reserving for each link an amount of spare bandwidth equivalent to the determined maximum difference.

2. The method of claim 1, wherein the communication network is configured using a ring architecture.

3. The method of claim 2, wherein the plurality of links are communicatively coupled in series to adjacent links within the ring architecture via a communication connection.

4. The method of claim 3, wherein the communication connection includes a plurality of communication paths.

5. The method of claim 4, wherein each of the communication paths is provided for over a fiber optic cable.

6. The method of claim 4, wherein each of the communication paths carry unidirectional traffic.

7. The method of claim 6, wherein each of the communication paths carry traffic in one of a clockwise and a counter-clockwise direction.

8. The method of claim 4, wherein each of the communication paths carry bidirectional traffic.

9. The method of claim 2, wherein the ring architecture is a self healing ring.

10. The method of claim 9, wherein the self healing ring employs one of 1:1 path switching, 1:1 line switching, and 1+1 path switching.

11. The method of claim 1, wherein said traffic includes at least one of point-to-point and point-to-multipoint communication connections.

12. The method of claim 1, wherein said traffic is routed using at least one of a shortest path method and a reduced shortest path method.

13. The method of claim 1, wherein the communication network is one of a SONET – Synchronous Optical Network, a wavelength division multiplexed network, and asynchronous transfer mode networks.

14. A connection admission control method for use in a communication network including multiple links comprising the steps of:

receiving a request for a communication connection;

determining for each link the bandwidth needed for the requested communication connection;

determining for each link the maximum additional spare bandwidth needed for rerouting the requested communication connection in addition to the spare bandwidth needed for rerouting all existing communication connections including the additional

traffic rerouted and the traffic removed in the event of a single link failure;

comparing the sum of the bandwidth needed for the requested communication connection and the maximum additional spare bandwidth for the requested communication connection with the available bandwidth for each of the links; and

accepting the communication connection request if sufficient available bandwidth exists for each of the links.

15. The method of claim 14, wherein the communication network is configured using a self healing ring architecture.

16. The method of claim 15, wherein the self healing ring employs one of 1:1 path switching, 1:1 line switching, and 1+1 path switching.

17. The method of claim 14, wherein the requested communication connection is a simplex communication.

18. The method of claim 14, wherein the requested communication connection is a duplex communication comprised of multiple simplex communication components, and wherein the steps of determining are separately made for each simplex communication component, and the step of comparing is made based on the sum of the bandwidth requirements determined for each of the simplex communication components.

19. The method of claim 14, wherein the requested communication connection includes at least one of point-to-point and point-to-multipoint communication connections.